One of the definitions of OS is that it is a resource manager. What do we mean by a resource manager? Explain.

The operating system manages the resources which are everything that is needed for a program to run like CPU, memory, space on the disk an I/O devices. The OS must allocates the resources when different processes or users on different computer use the system (processing time, space, memory).

The operating system must also let the use of the system in an effecient manner, and fair manner.

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Three main objectives or an operating system are convenience, efficiency and ability to evolve. Explain them?

1. Convenience: The operating system let the use of the computer more convenient, by hiding the details of the hardware, for example by using the Graphical user interface make it easier for user to use computer.
2. effeciency: The operating system make the use of resources more effecient, by minimizing response time and maximizing productivity
3. ability to evolve: The operating system allow development of the hardware, services without interfering with other services. for example the need for hardware upgrade or new hardware, new services, or fixing the errors in hardware or software.

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Don't use Pencil

Write ANY TWO OS features that are need for both the multi-programmed batch systems and time-sharing systems.

2 1. They Need Memory management
2. The both need CPU Management / scheduling

Write ANY TWO OS features that are needed in time-sharing systems but not in multi-programmed batch systems.

1-75 1. on-line file system do store data and code
2. ~~System~~ do not allow the dead lock to occur

What is more important for real-time systems: memory utilization or meeting the dead-lines?

1. meeting the deadlines

Poor CPU utilization is one of the problems with which type of systems?

1 Uni-Programming Systems

What is difference between client-server and peer-to-peer systems?

- Client-server: each node in the system can be either a server that give services to client, or a client that request services from a server
- Peer-to-Peer System: The nodes in the system can be both client and server at the same time.

5

Which components of the operating systems is responsible for the following activities:

Disk scheduling: Secondary Storage Mangement

Memory management of I/O: I/O subsystems Management

Mapping files onto secondary storage: File management

Allocating and deallocating memory space as needed: Main memory management

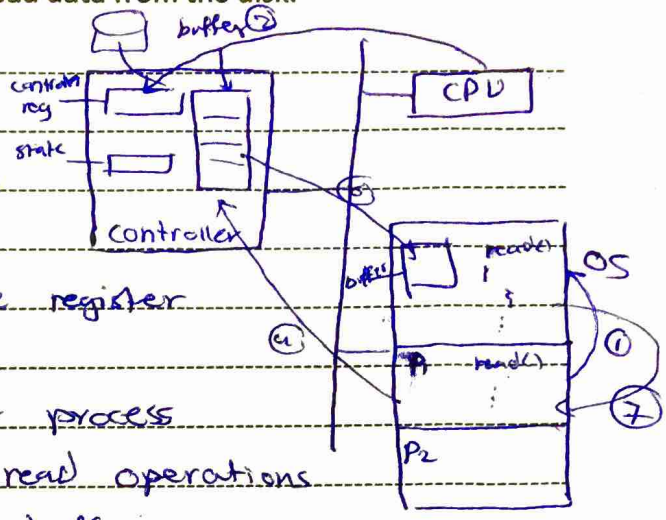
Providing mechanisms for deadlock handling: Process management

Deciding which processes and data to move into and out of memory: Main memory management

Providing mechanisms for process communication: Networking (Distributed systems)

Distinguishing between authorized and unauthorized usage: Protection management

With the help of a diagram, write the steps required to read data from the disk.



1. First the Application program must do a system call to operating function (e.g read). [CPU]
2. The operating systems must load the register with the apropriate value.
3. The CPU may switch to another process
4. The disk controller performs the read operations and brings the data into its buffer
5. The controller then sends an intrrupt to the CPU
6. The Intrupt handler moves the data from controller buffer to OS buffer
7. The required data is then moved to user memory space from the Operating System buffer [by using CPU]

What is a privileged instruction? Write any TWO privileged instructions for protecting memory.

Instructions that can be executed in monitor mode only.
To protect memory load base and load limit registers must be privileged instructions.

What is absolute code and relocatable code?

absolute code: The code which the address of instructions and data are binded (fixed) at compile time, the absolute code is generated when the ~~#~~ Memory location is known at compile~~#~~ time.

relocatable code: The code which the address of instructions and data are binded (fixed) at load time, the relocatable code is generated when the memory location is Not known at compile time.

What is difference between contiguous and non- contiguous memory management techniques?

Contiguous memory management: each ~~The~~ Process must be loaded into specific memory location without breaking it into Parts, Single Partition and multipie Partion (fixed-dynamic) are two types of Contigruous.

non-contiguous memory management: paging and segmentation and combination of Paging and segmentation are the types of this we can devide the Process into Parts in this technique.

Write two benefits of virtual memory?

2 1. Only Part of the program need to be in memory for execution the Process.
2. allow address space to be shared by different Processes.

What is resident set of a process?

2 Portion of Process that is in the main memory.

Which page replacement algorithm gives minimum page faults?

2 Optimal algorithem.

Process turnaround time increases when virtual memory is used. Why?

2. ~~When the Page is swapped out~~
every time the Page is (~~swapped out~~ replaced) and then reloaded,
the turnaround time increases.